

The localization of ^3H -phenoxybenzamine in the arterioles of the cat pancreas

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Phenoxybenzamine (Ph-b) produces a prolonged blockade of alpha-receptors for catecholamines in smooth muscle. Examination of the fine structural detail in the area of apposition of adrenergic axons to arteriolar smooth muscle in the pancreas does not in itself indicate a morphological identity for such receptors (Lever, Graham, Irvine & Chick, 1965). It was therefore of interest to examine the distribution and localization of ^3H -labelled Ph-b in the pancreatic arterioles of the cat, using electron microscopical autoradiography (Lever, Spriggs & Graham, 1968). An isolated cat pancreas was perfused at 4 ml./min with Tyrode solution as previously described (Graham, Lever & Spriggs, 1968). Control pancreatic specimens were taken and the pressor response to noradrenaline (NA) $2.94 \times 10^{-6}\text{M}$ recorded. ^3H -Ph-b was added to the perfusion fluid (2×10^{-5} g/ml.) for 14 min (total 3.68m and 1.904 mc). Normal Tyrode solution was perfused for a further 66 min before taking additional pancreatic specimens. It was established that the pressor response to NA had been abolished.

Pancreatic arteriolar profiles in developed autoradiographs were photographed and printed at $\times 18,000$ magnification: montages were assembled, cellular elements identified and silver grain densities expressed in terms of unit area.

Autoradiographs of pre-Ph-b-infused specimens showed a consistent low count of randomly distributed silver grains. Table 1 shows the results obtained from fourteen arteriolar profiles from Ph-b-perfused specimens. It is evident that Ph-b penetrated into endothelial and muscle nuclei. The counts for endothelial and muscle cytoplasm are, however, significantly higher than all other counts. Some of this localization might indicate the sites of alpha-receptor blockade.

TABLE 1. *Silver grain counts per unit area from autoradiographs of ^3H -Ph-b-perfused pancreatic arterioles*

	1	2	3	4	5	6
Variable	Smooth muscle	Endothelium	Lumen	Extra-cellular space	Muscle and endothelial nuclei	Exocrine cells
<i>n</i>	115	62	54	70	40	59
Mean	363.9	328.8	91.8	146.9	209.7	122.4
S.D.	213	195.4	67.4	108.7	161.7	47.8
c.v. %	58.5	59.4	73.4	73.9	77.1	39

Highly significant correlations $1 \sim 2 > 5 > 3, 4$

n, No. of fields counted.

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